

## Claims

1. Coupling closure (1) for essentially environmentally-sealed, reversible closure of (in particular flexible) containers or hose elements as well as for  
5 essentially environmentally-sealed filling and/or refilling of bulk material from (in particular flexible) containers or hose elements, comprising: at least one first flexible band (2) with at least one first (in particular continuous) closure element (10), in particular a tongue, on its inner side (6); and at least one second flexible band (4) with at least one second (in particular continuous) closure element (12), in particular a groove, on its  
10 inner side (8) that is complementary to the first closure element (10) and enables a reversible, sealed closure with this; whereby the first and second band (2, 4) and/or the first and second closure element (10, 12) are in particular essentially equal in length; whereby the first and second band (2, 4) are in particular connected with one another via their respective end segments, in particular to form a closed circumference; and whereby the top side (14) of the first band (2) comprises at least one third (in particular continuous) closure element (18) and the top side (16) of the second band (4) comprises at least one fourth (in particular continuous) closure element  
15 (20).  
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2. Coupling closure (1) according to claim 1, characterized by at least one fifth and/or sixth closure element on at least one outer side of first and/or second band.  
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3. Coupling closure (1) according to claim 1 or 2, characterized by a closure cover (30) comprising: at least one seventh and/or eighth closure element (32, 33) that is or, respectively, are complementary to the third and/or fourth closure elements (18, 20) of the top sides (14, 16) of the first and second band (2, 4); whereby the seventh and/or eighth closure elements (32, 33) can be connected with the third and/or fourth closure elements (18,  
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20) to form a temporary covering of the connection slit (34) of first and second band when the inner sides (6, 8) of first and second band (2, 4) exist connected with one another via an interaction of first and second closure element (10, 12).

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4. Coupling closure (1) according to claim 3, characterized in that the closure cover (30) is connected with the first or second band (2, 4), in particular in one piece, in particular by means of at least one film hinge (28).

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5. Coupling closure (1) according to claim 3 or 4, characterized in that the closure cover (30) comprises at least one control grip (42).

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6. Coupling closure (1) according to any of the preceding claims, characterized in that the first and/or second band (2, 4) in particular comprises or, respectively, comprise at least one control grip, in particular on the outer side (22, 23).

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7. Coupling closure (1) according to any of the preceding claims, characterized by a flexible bag (38, 40) or hose whose opening edge (26) is connected separate or as one piece with the first and second band (2, 4).

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8. Coupling closure (1) according to any of the preceding claims, characterized in that at least the inner side (6, 8) and/or the top side (14, 16) of the first and/or second band (2, 4) comprises or, respectively, comprise a bonding and/or adhesive layer, at least in section.

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9. Docking device (36) for (in particular environmentally-sealed) filling and/or refilling of bulk material, comprising: a first and a second coupling closure

(1, 1') according to any of the preceding claims; whereby the first and second band (2, 4) of the first coupling closure (1) and the first and second band (2', 4') of the second coupling closure (1') are in particular essentially equal in length; and whereby the third and fourth closure elements (18, 20) of the top sides (14, 16) of first and second band (2, 4) of the first coupling closure (1) are complementary to the third and fourth closure elements (20', 18') of the top sides (14', 16') of first and second band (2', 4') of the second coupling closure (1'); such that the first and second bands (2, 2', 4, 4') of first and second coupling closure (1, 1') can be reversibly connected with one another, in particular in an environmentally-sealed manner.

10. Docking device (36) according to claim 9, characterized by at least one fifth and/or sixth closure element on at least one outer side of first and/or second band of first and/or second coupling closure, which fifth and/or sixth closure element is or, respectively, are complementary to the seventh and/or eighth closure elements of the closure cover or, respectively, closure covers of first and/or second coupling closure.

11. Docking device according to claim 10, characterized in that the closure cover (30) of the first coupling closure (1) is or can be reversibly connected with at least one seventh and/or eighth closure element (24') of the second coupling closure (1'), and in that the closure cover (30') of the second coupling closure (1') is or can be reversibly connected with at least one seventh and/or eighth closure element (24) of the first coupling closure (1) when the third and fourth closure elements 18, 18', 20, 20') of first and second coupling closure (1, 1') exist connected with one another.

12. Docking device (36) according to any of the claims 9 through 11, characterized in that

the first and/or second coupling closure (1, 1') can be or is connected with a flexible container (38, 40) or flexible hose or hose element.

13. Docking device (36) according to any of the preceding claims 9 through 12,  
5 characterized in that  
the first and the second coupling closure (1, 1') are essentially identical.

14. Coupling closure (50) for essentially environmentally-sealed, reversible  
closure of (in particular flexible) containers or hose elements and/or for  
10 essentially environmentally-sealed filling and/or refilling of bulk material  
from (in particular flexible) containers or hose elements, comprising: in  
particular essentially rigid frame band (52, 54) and articulation devices  
(56); whereby immediately adjacent frame bands are connected with one  
another via respectively at least one articulation device between these  
15 frame bands to form a circumferential folding frame (58); such that the  
inner sides (60, 62) of at least two adjacent and/or opposing frame bands  
can be folded one atop the other to form an (in particular environmentally-  
sealed) closure.

20 15. Coupling closure (50) according to claim 14, characterized in that the  
folding frame (58) comprises x frame bands (52, 54) and x articulation  
devices (56), whereby in particular  $x = 2 \cdot n$  and n is a natural number  
greater than or equal to 2.

25 16. Coupling closure (50) according to claim 14 or 15, characterized in that the  
articulation devices (56) represent hinges, film hinges and/or elastic  
materials.

17. Coupling closure (50) according to any of the claims 14 through 16,  
30 characterized in that

the folding frame (58) comprises: six frame bands (152, 154, 184, 186, 188, 190) and six articulation devices (176, 178, 180, 182, 196, 198); with a first pair (192) of adjacent frame bands (184, 186), in particular of essentially equal length, connected via one articulation device (196); with a second pair (194) of adjacent frame bands (188, 190), in particular of essentially equal length, connected via one articulation device (198); and with a third pair (156) of frame bands (152, 154) that are not adjacent and/or are not directly connected via one articulation device, which frame bands (152, 154) in particular of essentially equal length; whereby the sum of the length of one frame band (184, 186) of the first pair (192) and the length of one frame band (186, 188) of the second pair (194) is not greater than the length of one frame band (152, 154) of the third pair (156) of frame bands.

18. Coupling closure (50) according to claim 17, characterized in that the inner side of the first frame band (184) of the first pair (192) and the inner side of the first frame band (186) of the second pair (194) are both turned towards the inner side of the first frame band (152) of the third pair (156), and in that the inner side of the second frame band (186) of the first pair (192) and the inner side of the second frame band (190) of the second pair (194) are both turned towards the inner side of the second frame band (154) of the third pair (156) to form a sealed closure slit.

19. Coupling closure (50) according to any of the claims 14 through 18, characterized in that, in the region of at least one of its circumference edge [sic], the folding frame (58) comprises an essentially circumferential sealing lip (200) extending inwards and/or over the edge.

20. Coupling closure (50) according to any of the claims 17 through 19, characterized by

at least one spacer (212, 214, 216, 218) on the outer side of first and/or second frame band (184, 186, 188, 190) of first and/or second pair (192, 194) of frame bands, which spacer is arranged closer to the common articulation device(s) (176, 178, 180, 182) with which frame band(s) (152, 154) of the third pair (156) connect to frame bands than to the articulation device(s) (196, 198) that connect the frame bands of the same pair to frame bands.

21. Coupling closure (50) according to any of the claims 14 through 20,  
characterized in that  
the inner sides (60, 62) of the frame bands (52, 54) comprise first and second closure rails (64, 66) (in particular complementary closure rails and/or elastomeric closure rails or closure rails made from a springy-elastic material) at least in sections for environmentally-sealed closure; whereby the total length of the first closure rail (64) essentially corresponds to the total length of the second closure rail (66); and whereby the first and second closure rails or their sections are arranged on the inner sides of the frame bands such that they form an environmentally-sealed closure slit, in particular interlock flush with one another, given frame bands (52, 54) folded onto one another.
22. Coupling closure (50) according to any of the claims 14 through 21, characterized in that  
first and/or second closure rails (64, 66) extend on the inner sides of articulation devices (56) and/or exist or can be applied on these.
23. Coupling closure (50) according to claim 21 or 22, characterized in that the first closure rail (64) represents a groove and the second closure rail (66) represents a tongue complementary to the groove.

24. Coupling closure (50) according to any of the claims 21 through 23,  
characterized in that  
at least one first closure rail is present at least in sections on the inner side  
of adjacent first and second frame bands, and at least one second closure  
5 rail is present at least in sections on the inner side of adjacent third and  
fourth frame bands.
25. Coupling closure (50) according to any of the claims 14 through 24,  
characterized by  
10 at least two control grips (162, 164) that can be applied or are present on  
non-adjacent frame bands.
26. Coupling closure (50) according to claim 25, characterized in that  
at least one control grip (162, 164) possesses at least one centering and/or  
15 arresting unit (166, 168; 170, 172) for the interaction with a corresponding  
coupling closure (in particular its centering and/or arresting unit) to form a  
docking device.
27. Coupling closure (50) according to any of the claims 14 through 26,  
20 characterized in that  
at least the folding frame is designed as one piece.
28. Coupling closure (50) according to any of the claims 14 through 27,  
characterized in that  
25 at least one (in particular all) frame bands (52, 54) exhibit on the top side  
(68, 70) at least one first closure element (72) (in particular an elastomeric  
closure element or a closure element made from a springy-elastic material)  
at least in sections.

29. Coupling closure (50) according to claim 28, characterized in that the first closure element (72) represents an (in particular continuous) groove and/or tongue.
- 5 30. Coupling closure (50) according to any of the claims 14 through 29, characterized by at least one second closure element (74) on the outer side of at least one frame band (52, 54).
- 10 31. Coupling closure (50) according to any of the claims 14 through 30, characterized by at least one closure cover (80) with at least one third closure element that is essentially complementary to the first closure element; and/or with at least one fourth closure element that is essentially complementary to the second closure element; such that the closure cover covers the closure slit of the folding frame at least in section given a closed coupling closure.
- 15 32. Coupling closure (50) according to claim 31, characterized in that the closure cover is connected at least in sections with a frame band via a hinge, a film hinge or a flexible connection element.
- 20 33. Coupling closure (50) according to claim 31 or 32, characterized in that the closure cover is provided with at least one control and/or transport grip.
- 25 34. Coupling closure (50) according to any of the claims 14 through 33, characterized by a flexible container or a flexible hose or a flexible hose element that is connected sealed with the frame bands (52, 54) and/or the articulation devices (56).



35. Coupling closure (50) according to any of the claims 14 through 34,  
characterized in that  
at least the inner side (60, 62) and/or the top side (68, 70) of at least one  
frame band (52, 54) comprises or, respectively, comprise a bonding and/or  
5 adhesive layer at least in sections.
36. Coupling closure (50) according to any of the claims 14 through 35,  
characterized by  
at least one first arresting element (76) present on the inner side (60, 62) of  
10 at least one frame band (52, 54) and at least one first arresting opening (78)  
present in an inner side (60, 62) of at least one frame band (52, 54),  
whereby the first arresting element can engage (in particular reversibly) in  
the first arresting opening upon closure of the folding frame (58).
- 15 37. Coupling closure (50) according to any of the claims 14 through 36,  
characterized by  
at least one handle (80) on the outer side of at least two (in particular  
opposing) frame bands (52, 54), in particular in the region of or below the  
transition from the outer side to the top side (60, 62) of a frame band (52,  
20 54).
38. Coupling closure (50) according to claim 37, characterized in that the  
handle (80) comprises: at least one retention band (96) attached on the  
outer side of a frame band (52, 54), which retention band (96) comprises at  
25 least one second arresting opening (82); at least one first grip element (90),  
in particular a first grip plate; at least one second grip element (92), in  
particular at least one second grip plate; as well as at least one first and at  
least second hinge (86, 88) (in particular film hinge); whereby the first grip  
element (90) is connected with the retention band (96) via the first film  
30 hinge (86) and the second grip element (92) is connected with the first grip  
element (90) via the second film hinge (88); and whereby the second grip

element (92) possesses at least one second arresting element (94) (in particular in the edge region) that corresponds to the second arresting opening (82); and whereby the second grip element (920) can be folded onto the first grip element (90); and the second arresting element (94) can engage (in particular reversibly) in the second arresting opening (82).

39. Coupling closure (50) according to any of the claims 14 through 38, characterized in that,  
in at least one articulation (56) (in particular in two opposing or not- directly-adjacent articulations), adjacent frame bands (52, 54) and/or their extension in the articulation form an angle, in particular an acute or right angle, at least in sections, at least in the articulation device (56) in cross-section.
40. Coupling closure (50) according to any of the claims 14 through 39, characterized by  
at least one notch (57), in particular essentially parallel to the articulation rotation axis, at least along a section on the inner side of at least one articulation (56), in particular of opposing articulations.
41. Docking device (100) for (in particular environmentally-sealed) filling and/or refilling of bulk material comprising a first and a second coupling closure (50, 50') according to any of the claims 14 through 40, whereby the first and second coupling closures essentially coincide in number, length and arrangement of their frame bands (52, 54; 52', 54'), such that first and second folding frames (58, 58') that can be connected with one another result.
42. Docking device (100) according to claim 41, characterized in that  
the first closure element (72) of the top side of the frame bands (52, 54) of the first coupling closure (50) is complementary to the first closure element

(72') of the top side of the frame bands (52', 54') of the second coupling closure (50'), such that first and second coupling closures can be reversibly connected (in particular in an environmentally-sealed manner).

- 5     43.     Docking device (100) according to claim 41 or 42, characterized in that  
the first folding frame (58) comprises at least one (in particular  
circumferential) sealing lip (200) that rests or can be placed in a sealing  
manner on the edge and/or the sealing lip (200') of the second folding  
frame (58').
- 10     44.     Docking device (100) according to any of the claims 41 through 43,  
characterized by  
at least one second closure element (74, 74') on the outer side of at least  
one frame band (52, 54, 52', 54') of first and/or second coupling closure  
15     (50, 50'), which second closure element is complementary to the fourth  
closure element or the second arresting element (94) of the closure cover  
(80).
- 20     45.     Docking device (100) according to any of the claims 41 through 44,  
characterized by  
a flexible container and/or a hose or a hose element that is essentially  
connected environmentally-sealed with the first and/or second coupling  
closure (50, 50').
- 25     46.     Flexible container, comprising  
a coupling closure according to any of the claims 1 through 8 or 14 through  
40.
- 30     47.     Flexible container according to claim 46, characterized in that  
at least one extraction device (in particular in the form of a spoon or  
spatula) that can be or is connected with the flexible container.

48. Transport means, in particular hose, comprising  
at least one coupling closure according to any of the claims 1 through 8 or  
14 through 40.
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49. Method for production of a coupling closure according to any of the claims  
14 through 40, characterized in that  
the coupling closure is produced by means of an injection-molding  
technique, in particular by means of a two-component injection-molding  
10 technique, whereby a rubber-elastic material or a thermoplastic elastomer is  
used for the articulation devices and/or the sealing lip and a thermoplastic  
and/or duroplastic material is used for the frame bands.
50. Method for production of a coupling closure according to claim 49,  
15 characterized in that  
this method is implemented with a single injection mold, in particular in  
one stage, or with at least two injection molds, in particular in two or  
multiple stages.
- 20 51. Method for production of a coupling closure according to claim 49 or 50,  
characterized in that  
the articulation or articulations are sprued on adjacent frame bands, or in  
that one or more frame bands are sprued on adjacent articulations.
- 25 52. Method for (in particular environmentally-sealed) filling, refilling and/or  
emptying of flexible containers, characterized in that  
a) a first flexible container according to claim 46 or a transport means  
according to claim 48 is connected with a stationary or transportable second  
inventive flexible container claim 46 or a transport means according to  
30 claim 48 via the respective (environmentally-sealed) closed first and second

coupling closures according to form docking devices according to any of the claims 9 through 13 or 41 through 45,

b) the first and second coupling closures are opened while maintaining an environmentally-sealed docking device,

5 c) the bulk material is transported from the first container into the second container or vice versa or through the hose into the first or second container,

d) the first and second coupling closures are closed in an environmentally-sealed manner while maintaining an environmentally-sealed docking device, and

10 e) the coupling closures of the first container and second container are separated from one another under decoupling of the docking device, in particular an environmentally-sealed manner.

15 53. Use of the docking devices according to any of the claims 9 through 13 or 41 through 45 for environmentally-sealed filling, refilling and/or emptying of (in particular flexible) containers.